Integrating Environmental Restoration with Computer Science in New York Harbor with New York City Public Schools Phase II

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Project Overview: The ITEST / CCERS project, Phase II continues to focus with the aim of better understanding and promoting equitable practices that increase student motivation and preparation to pursue careers in the STEM fields by expanding and testing an innovative curriculum model that features locally relevant problem-based learning with students in underrepresented populations.

ITEST / CCERS respondents, on average, had higher scores on scientific identity (motivation) and higher levels of preparation to pursue STEM careers, with higher average scores of general STEM engagement than the comparison group. Underrepresented group (URG) ITEST / CCERS respondents, on average, reported higher levels of scientific identity (motivation) and engagement in scientific activities (preparation) to pursue STEM careers compared to URG students who did not participate in CCERS.

Lessons Learned & Insights Gained

Research findings indicate that participation in CCERS activities may have varying levels of impact across different groups (e.g., different grades, gender). Specifically, though we observed that participation in CCERS activities is related to higher reported scientific identity, a key predictor in STEM motivation and retention, further analysis revealed that the impact was even more evident among 11th grade students. In addition, when examining career interest, a key predictor for STEM motivation and persistence, we saw a similar pattern for 9th grade girls, where CCERS girls reported higher levels of career interest than girls in any other grade level or relevant condition.

Equity

Project partners have implemented an outreach strategy targeting community organizations and Title 1 schools in New York City Public Schools, that serve URM students in STEM related capacities. This outreach strategy has benefited participants, particularly those who engage in Pillar 1 (STEM Hubs) and Pillar 3 (ORT/ORS Programs) by reaching out to groups to offer opportunities directly through already established contacts within the NYCDOE administrative groups and educators who have participated in previous BOP programming. When working with URM students and groups in mentoring activities, engaging program participants with STEM professionals who identify as part of a diverse community group, when possible, allowed students to see pathways into STEM fields through exposure via mentorship.

New Challenges & Next Steps

BOP CCERS Final Phase IV project implementation will focus on promoting these underrepresented groups in particular to determine if the greatest impacts are being sustained with these subsets of the project. A four-year research progression aimed at integrating computational thinking (CT) and computer science (CS) core practices into existing BOP-CCERS teacher and student learning; ultimately equipping teachers and students to understand and build computational models of complex phenomena; and evaluating the degree to which students integrate CS core practices and CT habits of mind across related CCERS STEM disciplines.